

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:)
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Applicants: David E. Petersen, et al)
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Examiner: Nguyen, Hung T.)
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Serial No.: 10/005,399)
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Filed: 12/05/2001)
)
Group Art: 2636)
)
Attny. Docket: 120362 (322))

For: LOCOMOTIVE HAND BRAKE ALARM

Board of Patent Appeals and Interferences
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APPELLANT'S BRIEF UNDER 37 CFR 41.10

This brief is in furtherance of the Notice of Appeal filed in this application on August 13, 2004.

The fee set forth in 37 CFR 41.20(b)(2) is authorized to be charged to the assignee's Deposit Account in accordance with the attached Fee Transmittal form.

1. REAL PARTY IN INTEREST - 37 CFR 41.37(c)(1)(i)

The real party in interest in this Appeal is the assignee of the present application, General Electric Company, a corporation of the State of New York.

2. RELATED APPEALS AND INTERFERENCES - 37 CFR 41.37(c)(1)(ii)

There is no other appeal, interference or judicial proceeding that is related to or that will directly affect, or that will be directly affected by, or that will have a bearing on the Board's decision in this Appeal.

3. STATUS OF CLAIMS - 37 CFR 41.37(c)(1)(iii)

Claims cancelled: 1 and 2.

Claims withdrawn but not cancelled: none.

Claims pending: 3 - 14.

Claims allowed: none.

Claims rejected: 3 - 14.

Claim rejections appealed: 3 -14.

4. STATUS OF AMENDMENTS - 37 CFR 41.37(c)(1)(iv)

No amendment has been filed subsequent to the final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER- 37 CFR 41.37(c)(1)(v)

This invention relates generally to the hand brake of a locomotive, and more specifically to devices and methods used to provide an alarm indicating when the hand brake is engaged.

A typical prior art hand brake system 10, as illustrated in FIG. 1, includes a brake shoe 12 that is selectively urged against a wheel 14 of the locomotive by a mechanism including a drive chain 18 that is positioned by a hand wheel 16. A switch 30 is used to detect the position of the chain 18 and to provide a brake-engaged signal 32 to energize an alarm circuit such as indicator light 34 when the brake is engaged. The hand brake is designed only as a parking brake, and damage can occur to the brake shoe 12 and/or to the wheel 14 if the locomotive is moved with the hand brake system 10 engaged. Furthermore, the weight of the chain 18 imposes mechanical loads which can damage the switch 30.

The reverser of a locomotive is like the gear selector of an automobile in that it can be placed in a forward, reverse or neutral position. The throttle of a locomotive is a separate control that typically includes "notch" settings from zero (with the engine operating at idle speed and with no electrical power applied to the drive motors to propel the locomotive) through notch 8 (full power). The locomotive is moved by first moving

the reverser from neutral to either forward or reverse, and then advancing the throttle from notch zero to a desired power level.

An improved hand brake system 40 is illustrated in FIG. 2 and logic implemented by such a system is illustrated in FIG. 3. A switch 56 detects the position of the chain 18 and provides a brake-engaged signal 60 for logic step 80. A reverser position signal 72 indicates when the locomotive reverser is moved to a non-neutral (forward or reverse) position for logic step 82. An alarm is provided (step 88) if the reverser is moved to a non-neutral position when the hand brake is engaged. Thus, the alarm 88 of the present application occurs before the locomotive is moved, immediately upon the reverser being moved to a non-neutral position and before the throttle control is moved to a non-zero power setting.

The alarm of the present invention may take the form of the simultaneous activation of two existing alarms: a wheel slip alarm 44 (step 90) and a train line general alarm 48 (step 92). This is particularly useful when two or more locomotives are used together (a locomotive "consist"), since the engineer may be operating the consist from a first locomotive while the hand brake may be engaged in a second locomotive of the consist. The prior art brake indicator 34 that is energized in the second locomotive would be unavailable to the engineer in the first locomotive. However, the alarm 88 of the present application would alert the operator to the engaged brake immediately upon the movement of the reverser to a non-neutral position before the train is actually moved.

As illustrated in FIGs. 4 and 5, the switch 98 used to provide the brake-engaged signal 60 is connected to the drive chain 18 through a mechanism 106, 108 that supports the chain without imposing the weight of the chain on the switch 98.

6. GROUNDS OF REJECTION TO BE REVIEWED UPON APPEAL -

37 CFR 41.37(c)(1)(vi)

A) Claims 10-12 and 14 are rejected under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137).

B) Claims 3-5 and 9 are rejected under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137) in view of Hosaka (U.S. 4,962,570).

C) Claims 6-8 are rejected under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137) in view of MacDonnell (U.S. 3,854,417) further in view of Hosaka (U.S. 4,962,570).

D) Claim 13 is rejected under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137) in view of Hosaka (U.S. 4,962,570) further in view of Hoover (U.S. 4,161,717).

7. APPENDICES

A copy of the claims 3-14 involved in this appeal is attached as a claims appendix under 37 CFR 41.37(c)(1)(viii). No evidence appendix under 37 CFR 41.37(c)(1)(xi) or related proceedings appendix under 37 CFR 41.37(c)(1)(x) is required.

8. ARGUMENT 37 CFR 41.37(c)(1)(vii)

A) Rejection of claims 10-12 and 14 under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137).

The appellant argues that the cited prior art patent to Orschek does not render claims 10-12 and 14 *prima facie* obvious because these claims include material limitations which are absent from the reference. For the purposes of this one argument alone, these four claims may be grouped together.

Orschek does not teach or describe the limitations of independent claim 10 of "a mechanism connecting the switch and a hand brake drive chain...the mechanism defining a load path for supporting a weight of the drive bypassing the switch" or the limitations of independent claim 14 of "a mechanism connecting the switch and the drive chain without supporting a weight of the drive chain through the switch." The Examiner addresses these limitations by citing Orschek column 1, lines 11-24, which describes a chain linkage used for actuating a locomotive parking brake by hand. The Examiner appears to be focusing only on the existence of a drive chain while ignoring the claimed mechanism for supporting the weight of the chain. The claimed weight-supporting mechanism that avoids supporting the chain weight through the switch is lacking from the cited Orschek patent. Beyond the brief acknowledgement of known prior art chain-driven brakes in column 1, lines 11-24, Orschek makes no further mention of such chain-

driven systems, but rather goes on to describe an improvement in an air-operated braking system. Orschek fails to even recognize the switch failure problem solved by the weight-supporting apparatus of rejected claims 10-12 and 14.

Thus, the rejection of claims 10-12 & 14 under 35 USC 103(a) is not supported by the art and should be withdrawn.

B) Rejection of claims 3-5 and 9 under 35 USC 103(a) as being unpatentable over Orschek (U.S. 5,394,137) in view of Hosaka (U.S. 4,962,570).

The appellant argues that the cited prior art patents to Orschek and Hosaka do not render claims 3-5 and 9 *prima facie* obvious because these claims include material limitations which are absent from these references. For the purposes of this one argument alone, these four claims may be grouped together.

Each of these rejected claims each includes limitations directed to providing a locomotive hand brake position alarm in response to a coincident hand brake-engaged signal and a reverser out-of-neutral signal. Furthermore, each of these rejected claims includes limitations directed to providing the hand brake position alarm in the form of a combination of existing alarms: specifically the train general alarm indication together with the locomotive wheel slip alarm indication. The cited prior art patents do not teach or suggest logic or circuitry that uses this combination of input signals in order to provide this combination of output signals.

Orschek lacks any teaching or suggestion of the use of a reverser position signal as part of the parking brake detection and warning system. Orschek also lacks any teaching or suggestion of the use of a combination of a train general alarm and a wheel slip alarm together as an indication of a hand brake position. The Examiner relies on the teaching of Hosaka to fill these voids. However, Hosaka describes an automobile throttle control system, not a braking system or a brake warning system. Hosaka uses a wheel slip signal as an input to throttle control logic, but does not use a wheel slip indication as an output of brake-engaged logic. Furthermore, Hosaka uses a transmission reverse gear indication as an input to a throttle control system, not as an input to a brake position detection system. Neither Orschek nor Hosaka nor their combination teaches or suggests combining a brake-engaged signal with a reverser out-of-neutral signal. Neither Orschek

nor Hosaka nor their combination teaches or suggests combining a train general alarm indication with a wheel slip indication to alarm a brake-engaged condition.

Thus, the rejection of claims 3-5 and 9 under 35 USC 103(a) is not supported by the art and should be withdrawn.

C.1) Rejection of claims 6 and 8 under 35 USC 103(a) as being unpatentable over Orschek in view of MacDonnell further in view of Hosaka.

The appellant argues that the cited prior art patents to Orschek, MacDonnell and Hosaka do not render claims 6 and 8 *prima facie* obvious because these claims include material limitations which are absent from these references. For the purposes of this one argument alone, these two claims may be grouped together.

Independent claim 6 includes the limitations of "detecting an alarm condition when a preparation is made to energize a drive motor coincident with a hand brake being engaged by detecting movement of a master controller reverser of the locomotive to a non-neutral position coincident with the hand-brake being engaged." The Examiner admits that the combination of Orschek and MacDonnell does not teach such limitations, and the Examiner relies on the teaching of Hosaka to fill this void. However, Hosaka does not even discuss brake position detection and warning systems. Hosaka uses a reverse gear indication only as an input to a throttle control system. Nor does Hosaka combine the reverse gear indication with a brake-engaged signal. Hosaka provides no alarm upon the selection of a non-neutral gear. Thus, the combination of Hosaka with Orschek and MacDonnell fails to teach or suggest each of the limitations of claims 6 and 8 and the rejection under 35 USC 103(a) should be withdrawn.

C.2) Rejection of claim 7 under 35 USC 103(a) as being unpatentable over Orschek in view of MacDonnell further in view of Hosaka.

The appellant argues that the cited prior art patents to Orschek, MacDonnell and Hosaka do not render claim 7 *prima facie* obvious because this claim includes material limitations which are absent from these references.

Claim 7 depends from claim 6 and is thus allowable on the basis of the arguments presented above in paragraph C.1. In addition, claim 7 includes the limitations of "providing the alarm indication as a wheel slip indication coincident with a general alarm indication."

On page 10 of the Office Communication containing the final rejection, the Examiner states that the combination of Orschek and MacDonnell does not mention that "the apparatus includes wheel slip circuit for monitoring sliding motion of the wheels as to prevent the slip from occurring and to notify that problem to the train operator." The Examiner then cites Hosaka "for determining the presence of a slip and generating a slip indicative signal." The Examiner concludes "it would have been obvious...to employ the teaching of MacDonnell and Hosaka in the system of Orschek for producing a wheel slippage indicative signal when wheel slip is detected." However, the method of claim 7 does not include a step of producing a wheel slippage indicative signal when wheel slip is detected. Rather, claim 7 is directed to the use of a wheel slip alarm coincident with a general alarm as an indication of the hand brake being engaged when a preparation is made to energize a drive motor. Thus, the method of rejected claim 7 provides the wheel slip indication together with the general alarm indication even when no actual wheel slip is occurring. The locomotive engineer will recognize the unique combination of indications described in claim 7 as being indicative of a brake-engaged condition. Thus, the teaching of Hosaka regarding the detection of actual wheel slip and the use of that signal in a throttle control scheme does not teach or suggest the limitations of claim 7, and the rejection under 35 USC 103(a) should be withdrawn.

D) Rejection of claim 13 under 35 USC 103(a) as being unpatentable over Orschek in view of Hosaka and further in view of Hoover.

Claim 13 depends from claim 10 and is thus allowable on the basis of the arguments presented above in paragraph A. In addition, claim 13 includes the limitations of "a locked axle indicator; a master controller reverser position detector for producing a reverser position signal; and a logic device having the reverser position signal and the brake engaged signal as inputs and adapted to energize the locked axle indicator when the reverser is in a non-neutral position and the hand brake is in an engaged position."

On page 11 of the Office Communication containing the final rejection, the Examiner states that the combination of Orschek and Hosaka is missing the circuit that includes a locked axle indicator. The Examiner cites Hoover as teaching such a locked axle detector, and then goes on to conclude "it would have been obvious...to employ...a locked axle indicator in the system of Orschek for providing a warning signal if the

sensed speed of one and only one of the axles is less than a predetermined low threshold level." However, the device of claim 13 does not provide a warning of a locked axle when one and only one of the axles is less than a threshold level. Rather, the logic device of claim 13 provides the locked axle indication in response to the reverser position signal indicating that the reverser is in a non-neutral position when the brake engaged signal indicates that the hand brake is in an engaged position. Thus, the logic device of claim 13 having the reverser position signal and the brake engaged signal as inputs and having the locked axle indicator as an output is not taught or suggested in Orschek, Hosaka or Hoover or in their combination. Accordingly, the rejection under 35 USC 103(a) should be withdrawn.

Respectfully submitted,

A handwritten signature in black ink that reads "David G. Maire". The signature is written in a cursive, flowing style.

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CLAIMS APPENDIX

37 CFR 41.37(c)(1)(viii)

3. A hand brake position alarm for a locomotive, the alarm comprising:
a wheel slip indicator;
a general alarm indicator;
a hand brake position detection device for providing a hand brake engaged signal indicative of a hand brake of the locomotive being engaged;
a reverser position detection device for providing a reverser position signal indicative of a reverser of the locomotive being in a non-neutral position; and
a logic device having the hand brake engaged signal and the reverser position signal as inputs and having outputs connected to energize both the wheel slip indicator and the general alarm indicator upon the existence of coincident hand brake engaged and reverser position signals .

4. In a locomotive consist having a master locomotive and a slave locomotive interconnected by a multiunit communication line, a hand brake position alarm apparatus comprising:
a general alarm circuit of the multiunit communication line connected to a general alarm indicator in each of the master locomotive and the slave locomotive;
a wheel slip alarm circuit of the multiunit communication line connected to a wheel slip indicator in each of the master locomotive and the slave locomotive;
a master controller reverser position detector for producing a reverser position signal responsive to a position of a reverser in the master locomotive;
a hand brake position detection device for producing a hand brake position signal responsive to a position of a hand brake;
a logic device having the reverser position signal and the hand brake position signal as inputs and adapted to actuate the general alarm circuit and the wheel slip alarm circuit in response to simultaneous indications of the reverser being in a non-neutral position and the hand brake being in an engaged position.

5. A hand brake position indicating device for a multi-locomotive consist comprising:

- a multiunit communication line general alarm circuit;
- a multiunit communication line wheel slip alarm circuit;
- a hand brake position detection device for producing a brake engaged signal;
- a master controller reverser position detector for producing a reverser out of neutral signal; and
- a circuit energizing both the general alarm circuit and the wheel slip alarm circuit in response to coincident brake engaged and reverser out of neutral signals.

6. A method of alarming a hand brake of a locomotive, the method comprising:

- detecting an alarm condition when a preparation is made to energize a drive motor coincident with a hand brake being engaged by detecting movement of a master controller reverser of the locomotive to a non-neutral position coincident with the hand-brake being engaged; and
- providing an alarm indication in response to the alarm condition before the rail vehicle is moved with the hand brake engaged.

7. The method of claim 6, further comprising providing the alarm indication as a wheel slip indication coincident with a general alarm indication.

8. The method of claim 6, further comprising providing the alarm indication through a multiunit communication line interconnecting a plurality of locomotives for providing the alarm indication in each of the plurality of locomotives.

9. A method of alarming an engaged hand brake in a multi-locomotive consist, the method comprising:

- providing a hand brake engaged signal in response to a hand brake being in an engaged position;
- providing a master controller reverser out of neutral signal in response to a reverser being in an out-of-neutral position; and
- simultaneously activating a multiunit communication line wheel slip alarm circuit and a multiunit communication line general alarm circuit in response to coincident hand brake engaged and reverser out of neutral signals irregardless of a speed of the consist.

10. A device for detecting the position of a rail vehicle hand brake, the device comprising:

- a circuit comprising a switch for providing a brake engaged signal and an indicator responsive to the brake engaged signal;
- a mechanism connecting the switch and a hand brake drive chain, the mechanism movable with the drive chain to operate the switch between an engaged position and a disengaged position; and
- the mechanism defining a load path for supporting a weight of the drive chain bypassing the switch.

11. The device of claim 10, further comprising:

- an anchor bracket connected to the rail vehicle;
- a pivot arm connected to the drive chain and pivotally connected to the anchor bracket for movement with the drive chain;
- the pivot arm further comprising a stop surface for contacting the anchor bracket when the pivot arm is in a stop position.

12. The device of claim 11, wherein the pivot arm comprises an upper stop surface for contacting the anchor bracket when the pivot arm is in a first stop position and a lower stop surface for contacting the anchor bracket when the pivot arm is in a second stop position.

13. The device of claim 10, wherein the circuit further comprises:
a locked axle indicator;
a master controller reverser position detector for producing a reverser position signal; and
a logic device having the reverser position signal and the brake engaged signal as inputs and adapted to energize the locked axle indicator when the reverser is in a non-neutral position and the hand brake is in an engaged position.

14. A rail vehicle hand brake position indicating device comprising:
a circuit comprising a switch and an indicator responsive to a position of the switch;
a hand brake drive chain movable from an engaged position to a disengaged position; and
a mechanism connecting the switch and the drive chain without supporting a weight of the drive chain through the switch.

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